CHAPTER V
NATURAL RESOURCES

INTRODUCTION

This Chapter describes the major elements of the natural environment that are within the Town of Sutton. The protection, preservation, and enhancement of the natural environment are important to the residents of Sutton.

To achieve the recommendations of this Chapter, the Town should not view this Plan as a static document that lays out precisely what needs to be done for the next ten years, although in some cases it is able to do just that. In general, this Chapter is more like a lens focusing attention on certain critical environmental and resource issues that need to be monitored and that, in some cases, need further study at a fundamental level. The idea is to steadily increase the information base regarding important issues, make that information available to the public and decision makers in an accessible, clear, and consistent manner. From there this information should be used not only to refine management plans, but also to target and prioritize the need for additional information. It is useful to think of this Chapter as adaptive in the sense that it can be adjusted as we learn more about the environmental systems in which we live.

1998 MASTER PLAN – NATURAL RESOURCES RELATED TOPICS

The first Sutton Master Plan was adopted in 1977 and subsequently updated in 1987 and again in 1988. The following goals were highlighted in the 1988 updated Master Plan, along with objectives and recommendations on how to meet the goals

Goal Two: To guide land use such that the rural character of the Town is preserved, maintained, and enhanced.

1988 Objectives

1) To encourage residential growth in cluster development in order to retain more open land for forestry, agriculture, and recreation.

1988 Recommendation

- The Town should retain its Cluster Ordinance and review it on a regular basis to ensure that it is accomplishing the goal of preserving open space.

Goal Three: To conserve and enhance the natural, scenic, and historic assets of the Town.

1988 Objectives

1) To identify and mark areas of scenic and historical significance.
2) To create and maintain an inventory of the important and/or unique historical and scenic assets of the Town.
3) To guide development so that these assets and values are preserved and enhanced.

4) To develop and maintain awareness of public and private resources which aid in insuring high standards of conservation values.
5) To guide development so as to preserve the quality and character of natural water resources, to prevent water pollution, and overcrowded public access.
6) To guide development so as to preserve the quality and character of natural land resources: to prevent erosion, excessive deforestation, destruction of scenic values and views, and to protect wetlands, aquifer recharge areas, brooks, rivers, lakes, and wildlife and endangered species' habitats.

1988 Recommendations

- The Conservation Commission should prepare an inventory of natural, scenic, and especially historic sites in Town.
- The Conservation Commission should study methods of protecting land by innovative means such as purchase of development easements and outright purchase with the help of land trusts and matching funds.
- The Town should use the high intensity soil survey as a strategy to protect land areas from inappropriate development while at the same time allowing property owners reasonable use of their land.

Goal Seven: To maintain and enhance recreational opportunities for Town residents.

1988 Objectives

1) To provide public access to ponds and lakes.

1998 Recommendations

- The Conservation Commission should study methods of protecting land by innovative means such as purchase of development easements and outright purchase with the help of land trusts and matching funds. These lands could become future recreation areas.

COMMUNITY SURVEY

In June 1999, a Master Plan Community Survey was mailed out to approximately 600 property owners. 195 surveys were returned for a 32% response rate. The following 6 survey questions relate to the natural resources in Sutton.

Please tell us why you feel Sutton is an attractive place to live.

Landscape/beauty of scenery	46
Outdoor activities	25
Recreational activities	9
Wildlife	7

Of all the values you place on living in Sutton, name the single most important to you.

Landscape/scenery	10
Outdoor activities	9
Recreational activities	2
Wildlife	1

Please describe how you would like Sutton to be in 20 years.

More open space	8
No current use land	3

Would you be in favor of allowing soil-based lot-sizing in Sutton (vs. 2 acre minimum)?

	# Respondents	% Responding
Yes	38	19.9%
No	130	68.1%
No Opinion	23	12.0%
Total	191	100.0%

Should the Town seek to preserve and protect the following resources through its ordinances and regulations?

Resource	Yes	% Responding (195 total)
Wildlife areas	163	83.6%
Lake/pond shoreline	160	82.1%
Water supply lands	160	82.1%
Land for forestry	151	77.4%
Floodplains	150	76.9%
Steep slopes	151	60.5%
Agricultural land	145	74.4%
Scenic hilltops	144	73.8%

Are you in favor of spending tax dollars in special situations to protect or acquire natural or cultural resources through purchase or conservation easement?

	# Respondents	% Responding
Yes	135	73.4%
No	19	10.3%
No Opinion	30	16.3%
Total	184	100%

GEOLOGY

Surficial Geology

The upper layers of geological materials (rocks and soils) on the bedrock (the crustal rock under the soil) were deposited by the last glaciation (Pleistocene), particularly the Wisconsinan stage. As the ice melted, the glacial debris formed two types of deposits: direct deposits falling or dumped by the ice as unsorted glacial till; and outwash deposits of sand, gravel, silt, and clay sorted out by the meltwater running from the ice. Streams and rivers into the valleys carried these latter deposits farther.

The following describes the glacial landscape features that are commonly found in the central region of New Hampshire.

1) Direct Deposits (Till)
   a) *Ground Moraine*
      Mostly till overlying bedrock, and often encompasses outcrops of uncovered bedrock. It is the unsorted, glacially ground-up debris of clay, silt, sand, gravel, and boulders dumped under the glacial ice and now covering bedrock. It was not distributed by meltwater. Morphologically, it is usually a zone of small hills and basins.
   b) *Drumlins*
      Low, humpbacked elliptical hills or mounds of till deposited and shaped by the moving glacier; the long axis is parallel to the direction of ice motion. Drumlins are oriented in a northwest-southeast position, the direction that the glaciers moved.

2) Outwash Deposits (sand, gravel, silt and clay)
   a) *Outwash Plains*
      A broad almost flat-topped deposit of sorted sand and gravel layers, built up by the streams of glacial meltwater flowing from the stagnant or melting glacier.
   b) *Kame and Kame Terraces*
      A hill, hummock, or short irregular ridge of stratified sand and gravel deposited in contact with the glacial ice; when the ice melted, the deposit settled into its present form. They range from 5 to 100 feet high. A kame terrace is a body of crudely sorted sand and gravel deposited between the glacier and an adjacent valley wall, thus forming the rather flat-topped terraces.
   c) *Eskers*
      Narrow, sinuous ridges of crudely stratified gravel and sandy gravel 10 to 100 feet high, deposited by meltwater streams flowing beneath the glacier in stream tunnels.
   d) *Varved Clays*
      Glacial clays of alternating sandy silt and silty layers, deposited in glacial lakes.

ARE THERE EXAMPLES OF THESE IN SUTTON?????

Soils

One of the most important natural resources and determinants of land use is soils. This is particularly important in Sutton, which has no public sewer or municipal water districts. Information about soil characteristics, with other supporting data, allows a community to make sound land planning decisions.

In addition to offering many environmental and agricultural benefits, soils are subject to contamination, erosion, and depletion at an alarming rate. Productive soils for farming and forestry are often prime development sites, that when built upon, become unavailable for those essential uses.

Soil is a collection of organic materials and minerals that reflects a combination of factors that formed it – climate, plant and animal life, parent materials, topography, and time. In New Hampshire, most parent material was deposited by glaciers or is glacial material that has been reworked and deposited as a result of the forces of wind and water.

Among the most restrictive soils, in terms of development potential, are the hydric soils. These soils form where there is water at or near the surface for at least several weeks. This extended period of saturation causes visible changes in the soils. Hydric soils are one of the three indicators used to identify wetlands. Subsurface disposal systems (septic systems) must be located certain distances (at least 50 to 75 feet) from hydric soils to ensure that the wastewater is treated before it may reach the water table or nearby wetland.

Like other soils, hydric soils may be classified by their drainage class. Most hydric soils are considered poorly drained or very poorly drained. Poorly drained soils are mineral-based soils. Other hydric soils are the very poorly drained soils, which have at least four inches of organic matter near the surface.

Recommendations

- Consider including soil based lot sizing requirements into the Zoning Ordinance, as outlined in the 1997 Rockingham County Conservation District "Ad-Hoc Soil Based Lot Sizing Study," as amended, to ensure that development is compatible with the soil being built upon.
- Through the Subdivision and Site Plan Review Regulations, require new developments to submit site-specific soil data to ensure that new developments have adequate carrying capacity for such proposed uses. Site specific data submittals should be consistent with "Requirements for Soils and Wetlands Data in Subdivision and Site Plan Review Regulations" prepared by the New Hampshire Office of State Planning in 1999.

SAND AND GRAVEL DEPOSITS

Large deposits of sand and gravel can be a valuable source of construction materials. Because of their permeability (the ability to allow water to flow through), sand and gravel deposits also tend to be good sites for water supply wells. Permeability also makes sand and gravel deposits very vulnerable to contamination; once contaminants are spilled or dumped, they can quickly spread. Therefore, special attention should be given to regulating land uses over sand and gravel deposits.

The Town of Sutton issues permits for commercial sand and gravel excavation under New Hampshire State statute (RSA 155-E:4-a) and XXXXXXXXXX.

There are currently X privately-owned sand and gravel pit operations, and X municipal gravel pit that will need to be reclaimed once all of the financially viable deposits have been removed. Reclamation means the restoring of an excavation site to a standard at least equal to those outlined in Town regulations. See the table below and the **Excavation Sites and Potential Sources of Contamination Location Map** for the locations of existing excavation sites within the Town.

Owner	Pit Size (Acres)	Sites	Amount Excavated 2003 (cubic yards)	Pit Assessed Value 2003

Source: Town of Sutton Assessor Database 2004

Recommendations

- The Town should look to acquire recreation or conservation easements at current excavation sites after reclamation takes place, which can serve as recreational areas and/or provide river access for residents.
- Any reuse of the sand and gravel pits located within the Town should be evaluated as to the appropriateness for the proposed activity, and best management practices should be used to prevent contamination of subsurface water bodies, as well as adjacent streams, ponds, rivers, and/or wetlands.
- INCLUDE RECOMMENDATION ON REGULATIONS ONCE I FIND THEM.
- Ensure that the Planning Board is annually review excavation operations to ensure compliance with State and local regulations.

WATER RESOURCES

This section on water resources includes information on surface water, groundwater, wetlands, and floodplains located in the Town of Sutton.

Surface Water

Surface water is an important part of the natural environment providing the Town with water, acting as retention/detention area, recreational areas, and as wildlife areas. Sutton contains many surface water bodies, as can be seen on the **Water Resources Map**.

The Town of Sutton lies within the Merrimack River principal drainage basin and the Contoocook River sub-basin, with the exception of the western face of Kings Mountain in the northwest corner of Sutton, which drains into Lake Sunapee and the Connecticut River principal drainage basin. The northeastern 20% of the Town flows into the Blackwater River, while the remainder flows into the Warner River.

Cascade Brook originates in Rollins State Park in Warner. Baker Brook originates in New London and flows into Cascade Brook east of Shaker Street in northeast Sutton. Cascade Brook then flows north to Wilmot Flat, where it empties into the Blackwater River.

The Warner River originates in Bradford and flows in an easterly direction through Warner before entering the Contoocook River in Hopkinton. One meander bend flows into Sutton along the southern boarder. At this bend is the confluence of Lane River. Beginning at Kezar Lake in North Sutton, Lane River flows south through Sutton Mills and South Sutton to the Warner River. Lyon Brook flows south from New London into Kezar Lake, with tributaries draining the eastern side of Kings Hill. Crate Brook and Kings Brook originate at the southern base of Kings Hill and flow into Land River at Sutton Mills. Thistle Brook flows from just south of Gile Pond, along Route 114, and into Lane River just below Sutton Mills.

Newbury Reservoir and Blaisdell Lake feed small streams which drain into the Warner River in Bradford. Stevens Brook begins near the intersection of Wilmot Road and North Road and slows along Interstate 89 into Warner.

There are six great ponds within the Town of Sutton, which are described in more detail below. A great pond is defined as XXXXXX.

Billings Pond
This natural pond is located in the southwest corner of Sutton, adjacent to the southern shore of Blaisdell Lake. Its 0.21 square mile watershed is contained within the watershed of Blasidell Lake and is part of the Warner River System.

Blaisdell Lake
The largest lake in Sutton, Blaisdell Lake is used extensively for recreation activities in the summer. Many summer residences front its shores. Blaisdell Lane is a natural lake, which has be raised by damming and drains a land area of 0.67 miles.

Gile Pond
Located south of North Sutton Village, this natural pond is bounded in part by Shadow Hill State Forest. It is also past of the Warner River system.

Kezar Lake
The second largest pond in Sutton, Kezar Lake is also extensively used in summer for recreational activities. A picnic area and public swimming beach are located in Wadleigh State Park, which occupies the southern shore of Kezar Lake. Nearly half of the 10.7 square mile watershed of this natural pond lies in the Town of New London.

Newbury Reservoir
Also known as the Loch Lyndon Reservoir, this artificial pond straddles the Newbury Town Line. Of the 127 total acres of this Reservoir, 90 acres are contained within Sutton.

Russell Pond
This natural pond is located ½ mile upstream from Blaisdell Lake.

	Area (acres)	Shoreline Length (miles)	Elevation (feet)	Average Depth (feet)	Max. depth sounded (feet)	Length (miles)	Width (miles)
Billings Pond	27	0.9	826	13	20	0.3	0.2
Blaisdell Lake	158	2.9	817	21	40	1.2	0.3
Gile Pond	57	1.2	902	8	10	0.4	0.4
Kezar Lake	143	2.1	906	NA	25	0.8	0.6
Newbury Reservoir	127	3.0	787	12	15	1.0	0.2
Russell Pond	15	0.6	851	6	8	0.2	0.1

Source: 1988 Sutton Master Plan

The Town has an obligation to protect its water quality. Conservation efforts in the past have helped to protect all these resource values through the Town's ordinances and through the acquisition of conservation land or easements. Because of these factors, it is important for the Town to take proactive steps to ensure that the quality and aesthetic value of the surface water resources are protected, enhanced, and valued.

Groundwater

Groundwater is an important limited resource. Without adequate amounts of high quality groundwater, development will be restricted. Groundwater is the subsurface water, which saturates sand, gravel and other soil deposits, and fills the cracks within the underlying bedrock. The top surface of this saturated zone is called the water table, which may be just below the surface or at some depth. In some locations, such as kettle hole ponds, the visible surface of the water may reflect the level of the groundwater of the adjacent land.

The groundwater is replenished largely by rainwater and snowmelt, which percolates downward through the soil. Other sources of replenishment, or recharge, may come from streams, lakes and ponds. Some groundwater flows to streams, ponds, and lakes and then becomes part of the surface water runoff. Although rainfall will percolate into all soil and weathered rock surfaces to some extent, areas of more porous sand and gravel will allow a greater amount of infiltration, and are specifically noted as "recharge zones" to signify their importance in recharging groundwater reservoirs. Therefore, it is important to identify and protect these areas from land uses that may be a significant threat of subsurface contamination.

In addition, if recharge areas are covered by development and impervious material, then the recharge of the underlying aquifers is reduced. The surface of the soil would be physically sealed by various materials such as asphalt or cement, which would not allow any water to penetrate the surface. This means that, not only would the recharge of the aquifer be impaired, but also there would likely be an increase in surface runoff and, therefore, an increase in the

occurrence of floods. Because aquifers are such a valuable natural resource, they should be protected.

If there is enough groundwater to provide an adequate water supply, that area of groundwater is called an aquifer. Most of the highly productive aquifers in New Hampshire consist of unconsolidated deposits of gravel and sand, floodplains, abandoned riverbeds and alluvial valleys.

Sutton contains one aquifer with high potential to yield groundwater. This aquifer is located near North Sutton Village. The largest stratified drift aquifer in Sutton is located in the eastern half of Town in an elongated strip from Cascade Marsh to Steven Brook. This aquifer has medium potential to yield groundwater but due to its shape and location, it is probably not a good candidate for a public water supply. Another aquifer with medium potential to yield groundwater lies on the west side of Route 114 from South Sutton to Sutton Mills. Water quality here may have been affected by the original landfill site, a septage disposal site, the burial of ashes from the solid waste incinerator, road salting on Route 114, and septic systems in the two villages. See the **Water Resources Map** for the known locations of aquifers in Sutton.

Wetlands

Wetlands are transitional areas between land and water. Wetlands are identified based on three indicators: the presence of water at or near the surface during part of the growing season, the presence of hydric soils, and the prevalence of vegetation adapted to grown in wet areas. Wetlands include, but are not limited to swamps, bogs, marshes, vernal pools, and similar areas.

Many wetlands have water present because the soils are poorly drained or the water table is very close to the surface. Sutton has a significant number of wetlands. The primary impacts facing wetland resources in Sutton today are the effects of development in their buffers or in the wetlands.

Wetlands have been viewed in the past as areas with little economic value and have been subjected to filling, draining, and dumping with little regard for the consequences. In recent times, however, it has been shown that wetlands provide benefits to the community. Wetlands provide numerous functions and values, some of which are listed below.

1) Flood Control – Some wetlands act as a giant sponge during periods of high run-off or flooding and then release this stored water slowly during drier periods.
2) Water Storage and Groundwater Recharge - The water in the wetlands can move up by means of evaporation, laterally by flowing in streams, and downwards, thus recharging groundwater.
3) Erosion and Sediment Control - Because wetlands vegetation absorbs or retains and slows down the rate of runoff, the water' s erosive powers are decreased, and the sediment settles out of the water.
4) Pollution Filtration - Wetlands vegetation and microorganisms reduce the harmful potential of pollutants such as organic material, bacteria, nitrates, and phosphates found in water.

5) Wildlife - Wetlands vegetation and water provides food, habitats, and breeding grounds for a wide variety of wildlife and fish.
6) Education and Recreation - Wetlands provide natural areas of study for all ages as they offer a diversity of wildlife habitats. Wetlands serve as excellent sites for photography, canoeing, snowshoeing, hiking, fishing, and hunting.
7) Environmental Health and Diversity - Generally, only wetland plants can tolerate wet soils and only certain types of animals and wildlife can tolerate such an environment.

See the **Water Resources Map** for more information and the locations wetlands in Sutton.

Floodplains
Floodplains are areas of land bordering a river or stream that flood periodically. Floodplains are important for at two major reasons: 1) they carry floodwaters, and 2) they provide valuable wildlife habitat. By trapping sediments and reducing erosion, undeveloped floodplains play an important role in preventing pollution of rivers and streams. See the **Water Resources Map** for the location of the floodplain in Sutton.

As development occurs in an upstream watershed the runoff volume and rate of flow increase due to the larger areas of paved and other impervious surfaces (e.g. roofs, roads and driveways). Flooding can consequently become more frequent and floodwaters more damaging since they are moving faster. Preserving floodplains becomes increasingly important as uplands are developed, as does attention in local Ordinances to minimizing the amount of impervious surfaces.

Retaining a floodplain in its natural state, is the most cost-effective way to reduce flood damages, and has been found to be far less expensive than dams, channelization, and other structural methods. Undeveloped floodplains also trap sediments and pollutants and reduce erosion. Since protecting a floodplain helps to reduce water pollution, development within the floodplain leads to more rapid movement of pollutants into the stream channel, which degrades the quality of the water.

Recommendations
- The Conservation Commission should initiate a public education campaign regarding the proper maintenance of septic systems, water conservation, and low-water lawn care methods.
- The Town should provide for comprehensive protection of shoreland of surface waterbodies through regulatory, educational, and voluntary efforts.
- The Town of Sutton should annually update its ordinances and regulations to adequately address the issues of stormwater management, erosion, and sediment control to improve the quality of the Town' s waterbodies to incorporate best management practices and technologies.
- Maintain the variety and large quantity of wetlands in Sutton and ensure that wetlands retain their functional values. The Town should provide for comprehensive protection of the wetlands through regulatory, educational, and voluntary efforts.
- When evaluating development proposals that affect wetlands, the entire wetland complex should be considered instead of the particular acreage of wetland being impacted. This includes considering the extent of habitat fragmentation and isolation,

the impacts on adjacent upland habitats, the effects of stormwater runoff, and the adequacy of buffer zones.
- Develop an Aquifer Protection Overlay Zoning District and a Wetlands Overlay Zoning District to help guide development where these two resources are present.
- Annually update the Floodplain Development Ordinance to ensure best management practices are being followed and that the recommendations outlined in the Community Assistance Visit are implemented.

POTENTIAL SOURCES OF CONTAMINATION

Development of all types has the potential to contaminate surrounding natural resources, especially water resources. Many commercial and industrial enterprises use various chemicals in everyday operations, which if not properly disposed may pollute water supplies. Therefore, development should be avoided where groundwater recharge areas and aquifer areas exist, and correspondingly, development should proceed where the least potential for aquifer recharge exists if there are no other development concerns.

According to the NH Department of Environmental Services OneStop data source (July 2004), there are 19 potential sources of contamination exist in Sutton. These include sites that have underground storage tanks, are hazardous waste generators, and/or are solid waste sites. See the **Excavation Sites and Potential Contamination Sites Location Map** for more information and locations.

Because of the high necessity for clean, safe, and available drinking water for the residents of the Town, there needs to be an awareness and emphasis placed on protecting this important resource.

Recommendations
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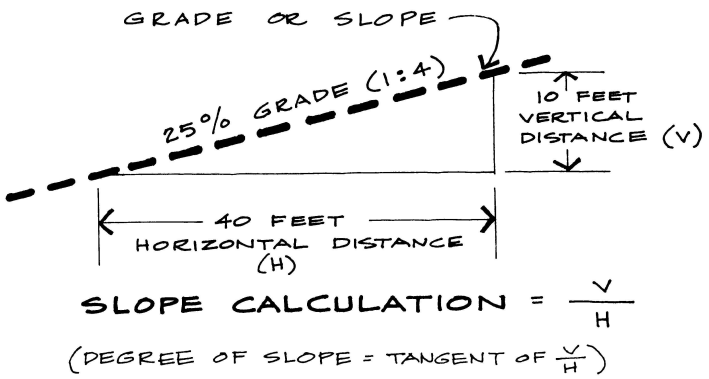
STEEP SLOPES AND SCENIC VIEWS

Steep Slopes
Slope is a very critical consideration in land use planning because it affects the capability and suitability of land to support development, as it relates to the site and the building, septic system and building design costs, and environmental impacts. Environmental impacts include such things as runoff, erosion, sedimentation, and pollution. Slope is the ratio of change in vertical elevation in relation to the change in horizontal distance, multiplied by 100 percent.



Source: The Illustrated Book of Development Definitions
Harvey S. Moskowitz and Carl G. Lindbloom, 1993

The percent of slope may indicate the potential for environmental problems. There are five slope classifications, which are presented below.

Slope Classification	Description
Flat (0-3%)	Easy accommodation of almost all types of land use
Gently Sloping (3-8%)	Suitable for many uses; are not prohibitive for development and make for excellent natural drainage conditions
Moderately Sloping (8-15%)	May be restrictive for certain land uses; low density residential development is feasible
Steep Slopes (15-25%)	Excavation and grading are almost always required; development not intensive in its coverage may be accommodated with limited environmental impact
Very Steep Slopes (Over 25%)	Subject to adverse environmental impacts and heavy construction costs; intensive use of land should be done cautiously

In Sutton, the majority of land has a slope of less than XXX. There are, however, a few areas with steep slopes, as can be seen on the **Steep Slopes and Scenic Vistas Map**.

Scenic Views
The landscape of a community defines its cultural, natural, and historical heritage and thus provides the residents of a community with a sense of identity. Sutton's identity is marked by the views of fields, water bodies, and the mountains. Sutton, with its hilly topography, offers numerous scenic views of rolling hills, ponds, and streams.

A scenic resource evaluation, from Vermont's "Mad River Resource Protection Plan," provides a list of key scenic attributes that transfer well to Sutton. These key scenic attributes include:

Physical Features
- Hills and hillsides
- Rivers, ponds, streams, and wetlands

- Vegetation, greenery, foliage, and wildflowers
- Agricultural Lands
- Wildlife

Important Aspects of Views
- Diversity and contrast within a view, such as a patchwork of open and wooded land
- Location of open space adjacent to historic New England housing, hedgerows, and stonewalls, etc.
- Continuous views that "follow" you as you travel along the road or are deep views
- Lack of scattered development or other disturbances in views
- Vantage points – the point or area that provides access to the view

Sutton has a diversity of scenic views and vistas, most of which are protected only by the willingness and desires of the landowners. No comprehensive inventory or analysis exists of Sutton's scenic views and vistas. As more development occurs within the Town, the scenic views, and locations to observe such views, will become more endangered.

INSERT INFO ON SCENIC RESOURCE ASSESSMENT

See the **Steep Slopes and Scenic Vistas Map** for the location of these scenic areas.

Recommendations
- The Planning Board should encourage developers to protect the naturally occurring steep slopes with slope easements.
- Adopt slope development standards to ensure the protection of the environment and safety in both the short and long term, as well as the aesthetics from both near and far observation points within the Town**.**
- Research the development of a Ridgetop or Hillside Zoning Ordinance that would specific development standards for scenic resource areas.

FLORA AND FAUNA

Wildlife
The challenge of conserving enough habitats to support healthy native wildlife populations is complicated by the varying habitat requirements of the number of diverse species located in Sutton. Some species require less than an acre of undisturbed forest, while others need territories covering a hundred acres. In addition, many species require several different habitat types through the course of the year. The more habitat diversity within the Town, the more likely it will support a diverse and abundant wildlife population.

A major threat to wildlife diversity is sprawling development patterns that cover the rural landscape, which cause habitat fragmentation through residential lawns and roads. Wildlife that are sensitive to human encroachment are restricted to these islands of undisturbed land and they may die out if an area becomes too small. The fragmentation of wildlife habitat may also result

in a loss of native plants, a reduced breeding gene pool, a loss of natural predators, and an increase in animals' susceptibility to disease.

For optimum wildlife habitat, blocks of unfragmented land should be void of significant human activity or development. Unfragmented lands often encompass many habitat types and can also provide safe travel corridors and migratory pathways. Reducing the size of forest tracts affects many species, even if all other habitat features remain the same. Fragmentation of undisturbed habitats with roads represents a source of mortality and creates barriers to wildlife movement.

Corridors and greenways are typically used not only by people for recreation and transportation, but also by wildlife to travel from one habitat to another. Maintaining viable and undeveloped corridors ultimately measures the biological success of the animals, particularly larger mammals within an area. The more biodiversity found within an area, the more valuable and self-sustaining the community becomes from both ecological and economic perspectives.

The size of a species population is usually dependent on the amount and location of suitable habitat. Animal populations can often be manipulated by varying the amount of available habitat. However, unless a species is rare and endangered, one species should not be favored over another. Providing a variety of habitats and protecting them from development and negative environmental impacts will increase wildlife diversity in Sutton. The Town should work to prevent the loss of wildlife habitat and manage properties for wildlife conservation.

Species of Special Concern

The Natural Heritage Bureau, in the NH Division of Resources and Economic Development's Division of Forest and Lands, maintains a database of known rare plant populations, rare wildlife populations, and exemplary natural community occurrences. Exemplary natural communities are distinctive communities of forests, wetlands, grasslands, etc., that are found in few other places in New Hampshire, or are communities that are in good condition. Species of concern are those species listed as threatened or endangered under the New Hampshire Endangered Species Conservation Act of 1979 or under the New Hampshire Native Plant Protection Act of 1987.

Listed/ Flag	Species Name	Habitat

F- Federal S- State T – Threatened E- Endangered

Flag indicates very high importance based on a combination of

(1) how rare the species or community is and (2) how large or healthy its examples are in that town.
Source: Natural Heritage Bureau, July 2004

The Natural Heritage data (which is updated periodically) represent the current documented information for the location and status of species of concern and natural communities in New Hampshire, but all significant plant and animal species have not yet been documented since a comprehensive natural resources inventory of the Town has not been done.

Recommendations

- Encourage more property owners, including the Town, to manage their properties for wildlife habitat.
- Inform landowners, using town sources of information, about wildlife habitat conservation programs, such as the New Hampshire Coverts Project and the Wildlife Habitat Incentives Program (WHIP). Encourage the Conservation Commission to participate in these programs.
- Educate landowners as to the location of wildlife corridors and conservation and land maintenance techniques that they can employ to help preserve and protect these areas.
- The Town should, where possible, acquire conservation easements or purchase the land where species of concern exist. Special priority should be given to those corridors that connect currently protected parcels of land in the Town or abutting Towns.
- A public education campaign should be carried out and/or combined with other efforts to educate the public about the presence of endangered, threatened, and/or species of special concern located within the Town of Sutton, and the environmental and societal benefits for preserving such species.

FORESTS

Forests serve a number of functions in both the community and the region, including protecting public water supplies and watersheds, serving as a source of renewable energy, providing lumber and other forest products, wildlife habitat, providing outdoor recreational opportunities, and contributing to the rural character of the community.

In the Town of Sutton, there are both publicly and privately managed forests. In the Town Forest system, recreational opportunities include hiking, wildlife observation, cross-country skiing, mountain biking, snowmobiling, and hunting. IS THIS TRUE???? The Sutton Town Forest system contains X lots that total approximately XXX acres and are scattered throughout the Town. They range in size from X to X acres and are currently managed by XXX. All of the Town Forests are managed as a multiple-use resource where consideration is given to timber harvesting, recreational opportunities, wildlife habitat, watershed protection, education, and preservation. Income from the timber sales was used to set up a Conservation Fund to help manage the forests and purchase other conservation land. IS THIS TRUE???????????

Landowners, often with the aid of professional foresters, manage the privately owned wood lots in Town. A Tree Farm is a privately owned forest managed to produce timber with added

benefits of improved wildlife habitat, water quality, recreation, and scenic values. The National Tree Farm program recognizes a landowner for practicing forest management for timber, recreation, wildlife habitat, and watershed values. To qualify as a tree farm a landowner must dedicate at least 10 acres to growing and harvesting forest products, have a written plan for the future management of their forest, follow management recommendations prescribed by a licensed forester, and demonstrate a commitment to stewardship of their forest for multiple values. There are 10 properties in Sutton enrolled in the National Tree Farm program that comprise 824 acres.

New Hampshire has a real estate tax and timber is considered to be real estate. Timber is taxed only at the time it is cut and at a rate that encourages the growing of timber. Timber on all land is taxable at 10% of the stumpage (standing timber value) at the time of cutting. Yearly timber tax totals have fluctuated over time, as can be seen in the table below. The tax collected goes into Sutton's general fund.

Year	Timber Tax Collected
1994	$40,467
1995	$15,156
1996	$28,190
1997	$32,141
1998	$16,855
1999	$39,631
2000	$42,340
2001	$27,374
2002	$37,908
2003	$11,466

Source: Sutton Town Reports

The list of town-owned forests and their acreage are provided in the table below and can be seen on the **Conservation Lands Map**.

Town Forest Lands

Town-Owned Forests	Acres
Total Acreage	

Source:

Recommendations

- A Town Forest Management Plan should be developed in order to have a plan in place for the management of this town resource. The public should be involved in the

process to ensure that all concerns regarding the management of the Town Forests are addressed.

- The Conservation Commission should notify abutters prior to the start of a timber harvest in Town Forests. The Selectmen's office should also be kept abreast of all planned activities in order to provide information to the public in a timely manner.
- Forest management information should be made available by the Town to private woodland owners to encourage long-term planning and consideration of all aspects of the forest ecosystem, including wildlife and watershed concerns. UNH Cooperative Extension for Merrimack County is an ideal source for forest management information.
- The Town should use its forests to provide residents with public land for outdoor recreational activities.
- The timber tax collected by the town should be dedicated for forest management, conservation, natural resources education, and land acquisition activities on behalf of the Town.

CONSERVATION LAND AND OPEN SPACE

Open Space

In its simplest definition, open space is land that has not been developed or converted to other uses. They include forests, fields, river corridors, wetlands, wildlife habitat, and greenway corridors, as well as agricultural lands and town parks. These are features that make Sutton a special place to live.

Open space is a very important part of any community. Open land can be used for commercial, recreational, and relaxation activities. It provides aesthetic and scenic values, wildlife habitat, and helps to minimize urban sprawl. Recreational opportunities on open land include walking, hunting, fishing, biking, wildlife viewing, and photography, just to name a few. In addition, open land costs the town less than developed land. In 1998, a Cost of Community Services Study was conducted in Sutton and it found that for every dollar generated in revenue from open space, only twenty-one cents were expended in services.[1]

The Town of Sutton has recently experienced tremendous growth in housing development. It is important to protect some open space areas to allow residents to relate to the desirable qualities that originally attracted them to the Town. One of the essential reasons to plan for open space is to set a course for the Town of coordinated development that maintains the Town' s high quality of life. Many times decisions are made on land use without the benefit of a unifying plan to coordinate the actions. The result is haphazard development that disregards the Town' s and/or region' s unique characteristics and sense of place.

Greenways

Greenways are corridors of open space managed for conservation and recreational purposes, that may be permanently protected land. Greenways often follow natural land or water features, and

[1] "Town of Sutton New Hampshire Cost of Community Services Study" Sutton Cost of Community Services Ad Hoc Study Committee, December 1998.

link nature reserves, open space, farms and forest land, parks, cultural features, and historic sites with each other as well as with populated areas. Some greenways may be publicly owned, some may be privately owned, and some are the result of public/private partnerships. In more developed areas, greenways can encompass natural or built features and can be managed primarily for resource conservation or recreation.

In more rural areas, greenways are natural corridors linking large unfragmented natural areas, preserving wildlife habitats and migration routes. Greenways serving as wildlife corridors can be virtually any type of traversable land, preferably of at least 200 feet in width. Common tracts of land that can be used as greenways include Class VI roads, railroad rights-of-way, and buffer areas along agricultural/forestry lands. Creating and maintaining a greenway system will help prevent those parcels of open space, which include forest, wetland, and agricultural lands, from becoming isolated islands, detached from one another and surrounded by development.

Conservation Lands

The Town owns several conservation parcels, all of which are managed by the Conservation Commission and afford various levels of conservation, preservation, and open space. The State of New Hampshire, the Town of Sutton, as well as private organizations own/manage approximately XXX acres of conservation land in Sutton. The following is a table of those known lands.

Conservation Lands	Ownership or Easement Held By	Acres
North Road and I-89 (map 1-113 lot 554)	Town	
North Road (map 3-126 lot 29)	Town	
Off Eaton Grange Road (map 4-70 Lot 198)	Town	
Route 114 and Russell Pond (Spires) (map 4-391 lot 36)	Town	
W/S Route 114 (map 6-38 lot 545)	Town	
Corporation Hill Road (map 6-68 lot 565)	Town	
Route 114 – Enroth Gift (map 7-926 lot 552)	Town	
Kezar Lake/Shore (map 8-18 lot 336)	Town	
Kezar Street (map 8-18 lot 340)	Town	
Sundell E/S Penny Ante Ally (map 8-109 lot 368)	Town	
Off Park Ave. on Kezar Lake (map 8-171 lot 362)	Town	
King Hill Reservation (map 8-369 lot 498)	Town	
Shadow Hill State Forest (map X lot X)	State	34
Wadleigh State Park (map X lot X)	State	43
TOTAL		

Source:

See the **Conservation Lands Map** for the location of these lands.

Current Use Tax Program

Current Use is a property tax approach to encourage landowners to keep open space undeveloped. Land that is participating in the Current Use Program is taxed on its potential to generate income in its existing, or current use. This is a type of preferential tax program that is aimed at encouraging open space. The alternative taxing strategy would be to tax the land on its income producing potential at the most highly developed use that could take place on it, such as a housing development or commercial business venture. Landowners who have qualifying land must apply to the Town to participate in the Program. Lands which typically qualify for the Current Use Program include farm land, forest land, tree farms, certain wetlands, and other undeveloped areas over 10 acres in size.

Over the last ten years, the Current Use program has been embraced by the residents of Sutton. Over 60% of the total land area in Town has been enrolled in the Current Use program annually, as can be seen below.

	# Acres in Current Use
1994	16,723
1995	16,362
1996	17,425
1997	17,735
1998	17,799
1999	18,040
2000	18,043
2001	17,520
2002	17,545
2003	17,452

Source: Sutton Town Reports

When land that has been participating in this program is removed and is changed to a more developed use, a Land Use Change Tax is charged. The Land Use Change Tax is set at 10% of the assessed market value of the land after development. One-hundred percent of the proceeds from the Land Use Change Tax are dedicated to open space through the Conservation Commission. The table below shows the Current Use Tax amount that has been assessed since 1994.

1994-2003 Land Use Change Tax Assessed

1994	NA
1995	$2,434
1996	$1,480
1997	$600
1998	$5,704
1999	$33,592
2000	$27,252
2001	$5,041

2002	$32,236
2003	$5,797

Source: Sutton Town Reports

Recommendations

- There should be consistent signage for all Town-owned Conservation Land.
- Identify and prioritize potential parcels of land that the Town feels should be protected because of important cultural, ecological, historical, or recreational value.
- The funding required for land stewardship should be evaluated for each easement under consideration by the Conservation Commission and money should be set aside each year for this purpose.
- Identify existing and potential greenways that are in the Town.
- Establish a program that encourages the donation of easements for agricultural lands, conservation lands, forestry lands, and open space lands.
- Investigate the use of Class VI roads and discontinued rail beds as greenway/trail/wildlife corridors that could be used to link existing open space and recreational lands.

TRAILS

Trails create opportunities to access open land in the community and allow residents to get outdoors to access natural, scenic, and recreational areas. A multi-use trail is defined as any trail that is used by more than one user group, or for more than one trail activity. Trail-user groups include pedestrians, hikers, equestrians, mountain bikers, and snowmobilers, just to name a few. These trail user groups benefit from multi-use trails through exercise, recreation, and nature viewing.

Trails are either classified as official or unofficial trails. Official trails are those owned and maintained by the state, town, or other entity, such as a nonprofit environmental organization or school that are developed and maintained through an official agreement. Unofficial trails are those trails that are not maintained by any entity but they are used by the public. A good example of an unofficial trail includes the use of the power line corridors or Class VI roads.

See the Transportation Chapter for the **Class VI Road and Trails Map** for more information on the location of official and unofficial trails within Sutton.

Snowmobiling

All of the legal motorized vehicle trails within Town are for winter snowmobiling use only, except where posted otherwise by private property owners.

IS THERE A LOCAL SNOWMOBILE CLUB???

Class A and B Trails

A Class VI road is one of the best types of rights-of-way to consider for an officially designated recreational trail system: there are no inherent liability concerns, the pathway has been

established, and public access is allowed. Typically, Class VI Roads are public rights-of-way that are used for recreational purposes, for through travel, for driveway access, and for other uses, such as agricultural and forestry uses. The owners of the properties abutting the Class VI road are not liable for damages or injuries sustained to users of the road, although they may choose to maintain the road for access to their property.

In 1993, the State enacted RSA 231-A, which allows municipalities to designate Class V and VI roadways as either "Class A" or "Class B" trailways. With either designation, the roadways are established as municipal trails. This designation will create ownership and responsibility for the trail by the Town. Class A Trails allow abutting landowners continued use of the right-of-way for vehicular use to existing structures, timber, or agricultural operations, but any new building or development is prohibited. Class B Trails are more restrictive and give landowners no special rights pertaining to the trail. Essentially, landowners lose all rights and privileges associated with the trail right-of-way, except as those permitted by the trail designation. Because of this, the law prohibits the conversion of any right-of-way to Class B trail status, where the right-of-way is the sole access point to a parcel, without written consent of all abutting landowners.

Class A and B trails can be established at the annual Town Meeting by including a warrant article on the specific proposal. In most towns, the proposal needs a simple majority in order to pass. In addition, Class A and B trail status can be rescinded through a vote at the Town Meeting.

Trails within town-owned land that are used for walking, bicycling, horseback riding, cross-country skiing, snowshoeing, or some other form of recreation, help to form an important link between the natural environment and the built environment by allowing people to access and enjoy nature in a low-impact manner. There are also many "unofficial" trails throughout the Town that are used by the public. Designating these trails as official trails will aid in providing maintenance by establishing who is responsible for the management of the trails.

Recommendations

- Work with the XXX to approach landowners for permission to develop more winter use trails in conjunction with the existing and potential trails opportunities.
- Work with XXX to incorporate some of the existing winter snowmobile trails, as appropriate, into an overall network of trails for Sutton.
- Continue to encourage maintenance of existing public trails by creating educational programs and providing support for interested individuals to do so.
- Publicize the public trails within Town by publishing a brochure, creating a trail-specific map series, and/or by holding special events.
- Undertake an on-foot survey of all Class VI roads within Town to gauge their ability to sustain certain types of trails usage.
- Link the Town Forests to one another by using existing trails or rights-of-way, by seeking easements, or by obtaining landowner permission for a pathway.
- Establish a permanent Trails Committee, comprised of various interests within Town, in order to oversee the maintenance of any trails that the Town wants to establish and to begin initiating contact with landowners of existing and proposed trails.

LAND CONSERVATION STRATEGIES

The following strategies could be employed to help meet the conservation recommendations that are listed throughout this Chapter.

Acquisition

Sometimes the best and simplest way to protect a key parcel of land is through outright acquisition and management. Acquisition may be through gifts or purchases and ensures that the property stays in the use that the donator prefers.

Bond Issue

The Town may agree to borrow money for a conservation project through a municipal bond issue.

Conservation Funds

Many towns have created separate conservation funds or open space acquisition funds specifically for the purpose of paying for land acquisition. Money for these funds may come from Town budget appropriations, land use change taxes, or proceeds from managing or selling Town property, just to name a few.

Appropriation from Town Budget - The Town can regularly set aside money for a conservation fund in their annual Town budgeting process. The Town should consider funding a capital reserve account, through the Capital Improvement Plan (CIP), to fund the acquisition of easements and conservation lands. These funds could also be used for match requirements when opportunities arise in which other agencies are funding most of the cost.

Land Use Change Tax - When a property that has been paying the lower Current Use Tax rate is removed from that program, the land use change tax penalty is paid to the Town that the property is located in. The penalty is 10% of the full market value of the land when it leaves the current use program. Many Towns, including Sutton, put all of this money directly into the conservation fund.

"Municipal Bill Round-Up" - An additional funding source for a variety of activities, such as greenway acquisition, easement acquisition, and creating bike trails and sidewalks, is the use of a "round up" program for tax bills, utility bills, and registration fees. Under such a program, the taxpayer could voluntarily round his/her bill payment up to a designated amount above the actual bill and designate it to any of the desired programs listed.

Proceeds from Managing or Selling Surplus Town Property - Towns that have property or resources that they manage, often can provide income to the Town, as well as the Conservation Fund. This is frequently through timber harvest operations on mature forest land owned by the Town. The proceeds from the sale of surplus Town property can also be dedicated to the Conservation Fund. Currently, the

Conservation Commission conducts timber sales in Town Forests as per the Forest Management Plan.

Cooperative Ventures with Private Organizations
When the interests of the Town to conserve open space match with the interests of a private organization, the potential for a cooperative partnership to protect land exists. This tactic will require some creative thinking and introductory discussions by Town officials with area organizations who have, or could develop, an interest in conserving open space.

Grants from Foundations
The Town would need to research available grants and develop proposals to seek funding to conserve a particular piece of property or type of resource within the Town. Funding could be sought from foundations at the local, state, regional, and national level.

Land and Water Conservation Fund
The Land and Water Conservation Fund is a federally funded program administered through the Department of Resources and Economic Department. Eligible projects must be outdoors and can include land acquisition for conservation, open space, or the development of an active recreation area, and the expansion or rehabilitation of existing areas. Approximately $600,000 is available each year with a $100,000 cap per project.

Land Trust
The Town should support non-profit land trusts that accept and pursue property and easements for land of local concern.

Tax Deeds
When the Town acquires property because the owner has not paid all of the taxes on the property, the Town can keep and manage the land and include it as part of the Towns conservation plan.

Town Surplus Funds
The Town can apply funds, if they are available, that are left over from prior years budgets to fund conservation projects.

Conservation Easement
Conservation easements are restrictions that landowners voluntarily place upon their property that legally bind the present and future owners of that property, restricting their ability to use some of those rights in order to protect the natural features of the land. Each conservation easement is custom tailored to the interests of the landowner, the receiving entity and the unique characteristics of the property. The land can be sold or deeded by the original owner and subsequent owners, but the restrictions of the easement are binding on all future owners. Typically conservation easements prevent development of land uses such as construction, subdivision and mining, but allow uses such as agriculture, forestry, wildlife habitat, scenic views, watershed protection and education. Conservation easements may or may not allow public access.

The conservation easement exists between a willing landowner and a qualified recipient, which can be the Town or State governments or various conservation organizations. Many public agencies and private organizations make these permanent agreements with landowners and oversee their compliance.

Conservation Subdivision Design
Rather than filling all available space with similar sized houses centered on uniformly sized lots, this development strategy focuses the construction in a smaller portion of the total land being developed, and provides for permanent protection of the open space not used for construction. The land selected for permanent open space protection should be designed to fulfill the open space interests of the entire community.

Landowner Education
A brochure should be developed that would provide information on the advantages to the landowner and to the community of conserving the land and the opportunities available for property owners to conserve the property via conservation easements or sale.

Mitigation
For the purposes of administering sensitive areas, mitigation includes rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and compensating for the impact by replacing or providing substitute resources or environments.

CONCLUSION

The primary focus of this Chapter was to identify the natural and man-made resources in Town, recognize the role they play in giving the Town of Sutton its character, and decide what strategies would best maintain the character of the Town and ecology of the resources. Most of the Town's resources are interconnected and any change to one may have a significant impact on the others. As the population increases, demands on many of these resources will increase, some to the point of threatening the quality and quantity of the resource. It is the goal of this chapter to help develop a balance between development and resource protection within the Town.

There needs to be the recognition that many natural resources do not stop at the Town's boundaries and that a regional approach may be critical to their long-term protection. Some of our natural resources are considered renewable, such as forests, while others, like soil, are not. Appropriate measures need to be taken to prevent contamination, erosion, depletion, and large-scale depletion and misuse of Sutton's natural resources.

The Town's existing open space consists of forests, fields, and wetlands and surface waters. Most of the dedicated conservation lands are carefully managed, though there are no management requirements for privately owned land other than what are found in the Current Use regulations. Most of the development pressure that is currently being felt by the Town is focused on privately owned open space. Because such lands are being targeted for development, it is

important that the Town identify critical habitats, greenways, and corridors that should be protected through purchase, easements, or other means. These actions will help to reduce land fragmentation and help maintain the rural, cultural, and historic character of the Town that makes Sutton the place it is today and the vision of what it wants to be tomorrow.